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May 10, 2006

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Re: Patent Application of Akira KUME et al.
Appln. No. 10/670,722
Filed: September 25, 2003
Art Unit - 3723
Examiner: Bryan R. Muller
Docket No. M004-5129

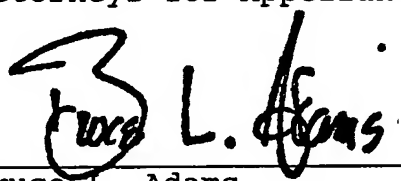
S I R:

Appellants submit herewith their brief on appeal in connection with the captioned application. A check in amount \$250.00 for a small entity status application is enclosed herewith to cover the required appeal fee. Should the check prove insufficient for any reason, authorization is hereby given to charge any deficiency to our Deposit Account No. 01-0268.

Respectfully submitted,

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Enclosures

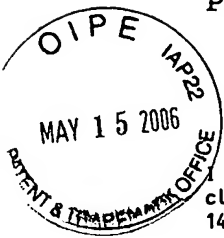
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MAILING CERTIFICATE

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Donna Riccardulli

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MAY 10, 2006

Date

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

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Application of :
Akira KUME et al. :
Appln. No. 10/670,722 : Group Art Unit - 3723
Filed: September 25, 2003 : Examiner: Bryan R. Muller
For: JIG PLATE, END FACE :
POLISHING MACHINE HAVING :
JIG PLATE, AND END FACE :
POLISHING METHOD :
(as amended) : Docket No. M004-5129

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APPEAL BRIEF UNDER 37 C.F.R §41.37

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S I R:

This is an appeal pursuant to 37 C.F.R. §134 from
the Examiner's decision rejecting claims 21-24, 28-30 and
35-38 as set forth in the final Office Action of September 8,
2005.

I. Real Party in Interest.

The real party in interest in this appeal is Seikoh
Giken Co., Ltd., assignee of the inventors' entire interest.



II. Related Appeals and Interferences.

None.

III. Status of Claims.

Claims 21-24, 28-30 and 35-38 stand finally rejected and are the subject of this appeal. Claims 1-20 and 34, 39-40 were canceled in the January 21, 2005 response and the February 8, 2006 amendment after final, respectively. Non-elected claims 25-27 and 31-33 were withdrawn from further consideration pending allowance of generic claims 21, 22 and 28, or any other generic claim, as noted in the June 14, 2005 response to the May 18, 2005 Office Action.

IV. Status of Amendments.

In response to the September 8, 2005 final Office Action, an amendment after final was filed February 8, 2006 presenting arguments traversing the prior art rejection under 35 U.S.C. §103(a). In an Advisory Action dated February 28, 2006, the Examiner indicated that the arguments presented in the amendment after final do not overcome the rejection under 35 U.S.C. §103(a) set forth in the final Office Action, and that the rejection of claims 21-24, 28-30 and 35-38 would remain as stated in the final Office Action.

V. Summary of Claimed Subject Matter.

The present invention is directed to a jig plate for supporting an optical connector plug and for use in combination with an end face polishing machine for polishing end faces of an optical fiber and a ferrule of the optical connector plug (spec., pg. 1, lines 3-6).

Prior to use in an optical connector, an optical communication fiber is adhered and fixed to a center hole of a ferrule and then an end surface of the ferrule and an end surface of the fiber are simultaneously polished to provide a smooth mirror surface. If the polished surfaces of the ferrule and the fiber are not vertical to a center axis of the ferrule, or if the polished surfaces are damaged, the accuracy of an optical connector having such ferrules connected with each other is deteriorated, thereby resulting in an increase in signal loss. Therefore, it is required that the surfaces of the ferrule and the optical fiber be polished with high accuracy. (Spec., pg. 1, lines 8-16).

In a conventional end face polishing apparatus, an eccentric plate which rotates on a concentric circle of a self-rotation disc and a planetary gear which transmits rotation of a motor for revolution to the eccentric plate are combined with a polishing plate to cause the polishing plate to self-rotate and revolve. The end faces of the ferrules and

optical fibers supported by a jig plate are pressed against a polishing member fixed to the polishing plate and polished. However, with the conventional end face polishing apparatus, it has been difficult to polish the end faces of the ferrules and optical fibers without causing variations in the polishing angle, radius of curvature and eccentricity. Further variations in ferrule lengths also occur after polishing. (Spec., pg. 3, lines 16-25).

The present invention overcomes the drawbacks of the conventional art. With reference to an embodiment shown in Figs. 1-9, an optical connector plug 100 is comprised of a plug housing 140 for supporting a ferrule 110 fixed to an end of an optical fiber 2 and a connecting member 145 connected to an exterior surface of the plug housing 140 (spec., pg. 13, lines 16-21; pg. 15, lines 20-22). The optical connector plug has a first axis 203 extending along the exterior surface thereof in a longitudinal direction of the connecting member 145 (spec. pg. 16, lines 22-24). The end face polishing machine is comprised of a polishing member 27 having a polishing surface for undergoing rotational movement in a first direction of rotation to polish an end face of the ferrule 110 and an end face of the optical fiber 2 during a polishing operation (spec., pg. 11, lines 13-20).

A jig plate 40 has a jig plate body 50 and a mounting part 54 connected to the jig plate body 50 for mounting the jig plate 40 on the end face polishing machine (spec., pg. 18, lines 5-10; pg. 24, lines 18-20). A holding part 51 is formed in a surface of the jig plate body 50 (spec., pg. 18, lines 11-13). A holding member 60 removably supports the optical connector plug 100 in the holding part 51 so that the end face of the ferrule 110 and the end face of the optical fiber 2 confront the polishing surface of the polishing member 27 when the jig plate 40 is mounted on the end face polishing machine. The holding member 60 has an engaging portion 62 for detachable engagement with the connecting member 145 of the optical connector plug 100 to removably support the optical connector plug 100 so that during a polishing operation, the ferrule 110 rotates in a second direction of rotation opposite to the first direction of rotation while the end face of the ferrule 110 and the end face of the optical fiber 2 contact the polishing surface of the polishing member 27 at a preselected angle of inclination and while an axis 200 extending in the direction of inclination of the end face of the ferrule 110 and the end face of the optical fiber 2 coincides with a second axis 201 of the optical connector plug 100 disposed generally orthogonal to the first axis 203. (spec., pg. 19, lines 10-19; pg. 22, line 20 to pg. 23, lines 16).

By the foregoing construction, during a polishing operation the optical connector plug can be maintained at a precise orientation relative to the polishing member so that an axis extending in the direction of inclination of the end face of the ferrule and the end face of the optical fiber coincides with an axis of the optical connector plug disposed generally orthogonal to another axis of the optical connector plug extending along an exterior surface thereof in a longitudinal direction of the connecting member which is disposed on the exterior surface. By this orientation, the end face of the ferrule and the end face of the optical fiber are polished with improved polishing accuracy to reduce displacement between the center of curvature of the end faces of the ferrule and optical fiber and a central axis of the optical fiber, thereby reducing insertion loss. (Spec., pg. 8, lines 7-17; pg. 38 lines 19-25).

VI. Ground of Rejection to be Reviewed on Appeal.

The single ground of rejection for review is the rejection of claims 21-24, 28-30 and 35-38 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Publication No. 2001/0055459 to Yamada et al. ("Yamada") in view of U.S. Patent No. 5,738,576 to Ohno et al. (Ohno).

VII. Argument

Rejection of Claims 21-24, 28-30 and 35-38 Under 35 U.S.C. §103(a) As Being Unpatentable Over Yamada in View of Ohno

It is well settled that the Examiner must satisfy his burden of establishing a prima facie case of obviousness by showing that some objective teaching or suggestion in the applied prior art taken as a whole and/or knowledge generally available to one of ordinary skill in the art would have led that person to the claimed invention, including each and every limitation of the claims, without recourse to the teachings in appellants' disclosure. See, generally, In re Rouffet, 47 USPQ2d 1453, 1456, 1457-1458 (Fed. Cir. 1998); In re Oeticker, 24 USPQ2d 1443, 1446-47 (Fed. Cir. 1992). In this case, the Examiner has failed to carry his burden of making out a prima facie case of obviousness with respect to the subject matter recited in independent claims 21 and 28 and the corresponding dependent claims, as set forth below.

A. Argument for Independent Claims 21 and 28

Independent claim 21 is directed to a jig plate for supporting an optical connector plug and which is used in combination with an end face polishing machine for polishing the end face of an optical fiber and the end face of a ferrule fixed to an end of the optical fiber. Claim 21 requires that

the optical connector plug has a plug housing for supporting the ferrule and a connecting member connected to an exterior surface of the plug housing, the optical connector plug having a first axis extending along the exterior surface thereof in a longitudinal direction of the connecting member. Claim 21 further requires that the end face polishing machine is comprised of a polishing member having a polishing surface for undergoing rotational movement in a first direction of rotation to polish an end face of the ferrule and an end face of the optical fiber during a polishing operation.

Claim 21 further requires a jig plate comprised of a jig plate body, a mounting part connected to the jig plate body for mounting the jig plate on the end face polishing machine, a holding part formed in a surface of the jig plate body, and a holding member for removably supporting the optical connector plug in the holding part so that the end face of the ferrule and the end face of the optical fiber confront the polishing surface of the polishing member when the jig plate is mounted on the end face polishing machine. Claim 21 further requires that the holding member has an engaging portion for detachable engagement with the connecting member of the optical connector plug to removably support the optical connector plug so that during a polishing operation, the ferrule rotates in a second direction of rotation opposite

to the first direction of rotation while the end face of the ferrule and the end face of the optical fiber contact the polishing surface of the polishing member at a preselected angle of inclination and while an axis extending in the direction of inclination of the end face of the ferrule and the end face of the optical fiber coincides with a second axis of the optical connector plug disposed generally orthogonal to the first axis.

Appellants respectfully submit that the structural and functional combination recited in independent claim 21 is not disclosed or suggested by the combined teachings of Yamada and Ohno.

According to the Examiner, the primary reference to Yamada discloses an end face polishing machine comprised of a polishing member 14 having a polishing surface for undergoing rotational movement in a direction of rotation (Fig. 2). Yamada further discloses an optical connector plug having a plug housing 8 (Fig. 3) for supporting a ferrule 9 holding an optical fiber and having a connecting member connected to an exterior surface of the plug housing. The optical connector plug has an adapter 2 for supporting the plug housing 8. A jig plate 1 is mounted opposite to a polishing plate 13 for polishing an end face of the ferrule 9. The jig plate 1 has a jig plate body with a holding part (i.e., the holding part

corresponding to the recess in the jig plate body in which the adapter 2 is fitted) for holding the ferrule 9 at an inclination (Fig. 6), via a holding member 4 (i.e., pair of adapter-spring pressing plates), relative to a surface of the polishing plate 13 during a polishing operation. (Final Office Action, pg. 5, lines 3-20).

As recognized by the Examiner, the jig plate disclosed in Yamada does not have any structure which permits the ferrule 9 to undergo rotation in a direction of rotation opposite to the direction of rotation of the polishing member 14 during a polishing operation (final Office Action, pg. 6, lines 5-6). In contrast, independent claim 21 recites that the holding member has an engaging portion for detachable engagement with the connecting member of the optical connector plug to removably support the optical connector plug so that during a polishing operation, the ferrule rotates in a second direction of rotation opposite to the first direction of rotation (i.e., the first direction of rotation being the direction of rotation of the polishing member).

Furthermore, with respect to the structure of the holding member recited in independent claim 21, the Examiner contends that the holding member 4 in Yamada has "an engaging portion (2, 2a) for detachable engagement with the connecting member of the optical connector plug" (final Office Action,

pg. 5, lines 20-21). Appellants respectfully disagree with the Examiner's contention and interpretation of the disclosure in Yamada.

The structure denoted by reference numeral 2a in Fig. 3 of Yamada corresponds to an adapter hook of the adapter 2 which functions to retain the optical connector plug within the holding part (i.e., the holding part corresponding to the recess in the jig plate body in which the adapter 2 is fitted) of the jig plate 1 (Yamada, paragraph [0034]). While the Examiner is correct in construing the adapter hook 2a as an engaging portion which detachably engages the connecting member 27 of the optical connector plug, as shown in Figs. 3 and 7 of Yamada, the engaging portion 2a does not form part of the holding member 4 (i.e., the engaging portion 2a does not form part of the pair of adapter-spring plates 4), as the Examiner contends. Stated otherwise, the engaging portion or adapter hook 2a in Yamada forms part of the adapter 2, not part of the holding member 4.

Thus, contrary to the Examiner's contention in the final Office Action, Yamada does not disclose or suggest a jig plate comprised of a holding member having an engaging portion for detachable engagement with a connecting member of the optical connector plug to removably support the optical connector plug, as recited in independent claim 21.

Accordingly, Yamada does not disclose or suggest a jig plate comprising a holding member having an engaging portion whose detachable engagement with a connecting member of an optical connector plug allows a ferrule of the optical connector plug to rotate in a direction opposite to the direction of rotation of a polishing member during a polishing operation, as required by independent claim 21.

The Examiner cited the secondary reference to Ohno for its disclosure of a prior art embodiment shown in Fig. 2A in which a ferrule 14 and a polishing surface 11 of a polishing member are rotated in different directions during a polishing operation (Fig. 2A; col. 3, line 64 to col. 4, line 10). The Examiner also referred to another embodiment in Ohno shown in Fig. 2B, however, in the Fig. 2B embodiment the ferrule 14 and a polishing surface 13 of a polishing member are rotated in the same, not different directions. Thus the embodiment of Fig. 2B in Ohno is clearly inapplicable for teaching rotation of a ferrule and a polishing member in different directions of rotation during a polishing operation.

Referring now to the embodiment of Fig. 2A in Ohno, the Examiner contends that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the jig plate of Yamada so that the ferrule is allowed to rotate in a direction opposite to the direction of

rotation of the polishing member during a polishing operation for the purpose of improving the polishing of the end face of the ferrule to enhance the transmission of data by the optical fiber supported by the ferrule (Final Office Action, pg. 6, line 15 to pg. 7, line 2). Appellants respectfully disagree with the Examiner's contention.

First, it is unclear how the Examiner proposes to modify the jig plate of Yamada in view of Ohno to arrive at the claimed invention. More specifically, with respect to the embodiments shown in Figs. 3 and 7 of Yamada, for example, how does the Examiner propose to modify the structure of the jig plate so that the ferrule 9 rotates at all during a polishing operation, and specifically rotates in a direction opposite to the direction of rotation of the polishing plate 14 (see Fig. 2)?

Moreover, the teaching in Fig. 2A (and also Fig. 2B if the Examiner continues to rely on this embodiment) of Ohno is not adequate to support the Section 103 rejection of independent claim 21 because one of ordinary skill in the art would be led away from rather than adopt or follow such teaching in Ohno. More specifically, while disclosing in Fig. 2A a conventional method of rotating a ferrule and a polishing plate in opposite directions during a polishing operation to provide the end face of the ferrule with a convex tip, Ohno

immediately qualifies such disclosure by explicitly warning that such conventional method "has some problems yet to be solved" (col. 4, lines 16-17). Ohno explicitly describes these problems in col. 1, lines 46-63).

Thus, contrary to the Examiner's contention, one of ordinary skill in the art would not have found it obvious to modify the jig plate of Yamada so that the ferrule is allowed to rotate in a direction opposite to the direction of rotation of the polishing member during a polishing operation for the purpose of improving the polishing of the end face of the ferrule to enhance the transmission of data by the optical fiber, as disclosed by Ohno, in light of the problems with such rotational operation disclosed by Ohno in columns 1 and 4 as set forth above.

Furthermore, Ohno discloses that one of the foregoing problems resulting from the polishing method shown in Fig. 2A is that such method "cannot provide the ferrule with a smooth convex tip" (col. 1, lines 45-46). This disadvantage in using the method shown in Fig. 2A of Ohno is contrary to the Examiner's motivation for modifying Yamada in view of Ohno as set forth above. Thus, the Examiner's motivation for modifying Yamada in view of Ohno is inadequate in view of the teachings to the contrary in Ohno.

Thus, contrary to the Examiner's contention, one of ordinary skill in the art at the time the invention was made would not have been led to modify the jig plate of Yamada in view of the teachings of Ohno so that the ferrule will rotate in a direction opposite to the rotational direction of the polishing plate during a polishing operation because such modification would be contrary to the express teachings of Ohno concerning the problems with such rotational operation, as disclosed by Ohno in columns 1 and 4. Accordingly, independent claim 21 is not rendered obvious by the teachings of Yamada as modified by Ohno because the references do not suggest the modifications that would be needed to replicate the claimed invention. In the context of obviousness rejections based upon the purported obviousness of effecting a required modification, the Federal Circuit has held that "[t]he mere fact that the prior art may be modified in [a given] manner ... does not make the modification obvious unless the prior art suggested the desirability of the modification". In re Fritch, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992). There is nothing in Ohno that would have suggested modifying the structure and operation of the jig plate in Yamada, as proposed by the Examiner, to achieve the specific structure and function of the jig plate discussed above and recited by independent claim 21.

Moreover, even assuming that the Examiner's proposed modification of Yamada in view of Ohno is proper under Section 103(a), the resulting combination does not lead to the structural combination recited in independent claim 21.

First, independent claim 1 requires a jig plate comprising a holding member having an engaging portion for detachable engagement with the connecting member of the optical connector plug to removably support the optical connector plug so that during a polishing operation, the ferrule rotates in a second direction of rotation opposite to the first direction of rotation. As set forth above, Yamada does not disclose a holding member having the engaging portion for performing the specific function recited in claim 21. Instead, in Yamada the engaging portion 2a forms part of the adapter 2, not the holding member 4. Furthermore, Ohno clearly does not disclose or suggest the specific structure of the jig plate recited in claim 21, including its mounting part, holding part, holding member and the recited structural and positional relationships between these components. Thus, for this reason alone, the combined teachings of Yamada and Ohno do not lead to the invention recited in independent claim 21.

Moreover, the combined teachings of Yamada and Ohno also do not disclose or suggest a jig plate comprised of a holding member having an engaging portion for detachable engagement with the connecting member of the optical connector plug to removably support the optical connector plug so that during a polishing operation, the ferrule rotates in a second direction of rotation opposite to the first direction of rotation while the end face of the ferrule and the end face of the optical fiber contact the polishing surface of the polishing member at a preselected angle of inclination and while an axis extending in the direction of inclination of the end face of the ferrule and the end face of the optical fiber coincides with a second axis of the optical connector plug disposed generally orthogonal to the first axis, as recited in independent claim 21.

With reference to the embodiment of the invention shown in Figs. 1-9, claim 21 requires that while the ferrule 110 and the polishing member 27 rotate in opposite directions of rotation during a polishing operation, the end face of the ferrule 110 and the end face of the optical fiber 2 contact the polishing surface of the polishing member 27 at a preselected angle of inclination and an axis 200 extending in the direction of inclination of the end face of the ferrule 110 and the end face of the optical fiber 2 coincides with a

second axis 201 of the optical connector plug 100 disposed generally orthogonal to the first axis 203 (i.e., the first axis being the axis extending along the exterior surface of the optical connector plug 100 in a longitudinal direction of the connecting member 145).

In the final Office Action (pg. 6, lines 1-5) and in the February 28, 2006 Advisory Action (see item 11 and Continuation Sheet), the Examiner contends that Yamada teaches the foregoing claimed positional relationship between the end faces of the ferrule and optical fiber and the polishing member and the positional relationships between the axis corresponding to the end faces of the ferrule and optical fiber and the axes corresponding to the optical connector plug and connecting member of the optical connector plug. Appellants respectfully disagree with the Examiner's contention and with the Examiner's interpretation of the disclosure in Yamada.

First, it is noted that in an attempt to arrive at the combination recited in independent claim 21, the Examiner has relied upon structural features from various different and unrelated embodiments of the ferrule holder assembly disclosed in Yamada. In combining the features from the various unrelated embodiments, the Examiner has not set forth any proper motivation for modification of such unrelated

embodiments to arrive at the claimed invention, as required by 35 U.S.C. §103(a).

More specifically, for the recitation in claim 21 requiring that "the end face of the ferrule and the end face of the optical fiber contact the polishing surface of the polishing member at a preselected angle of inclination", the Examiner has relied upon the embodiment of Fig. 6 in Yamada which is the only embodiment showing a ferrule holder assembly (and thus the end faces of the ferrule and optical fiber) being disposed at an inclination relative to the polishing surface. As disclosed by Yamada, the embodiment in Fig. 6 of Yamada is a modification of the embodiment shown in Fig. 3 (paragraph [0039]) which the Examiner has primarily relied upon for the features recited in claim 21.

However, in the rejection of claim 21, the Examiner also relied upon the embodiment shown in Fig. 7 of Yamada for its disclosure of a connecting member 21¹ to support the Examiner's contention that Yamada teaches the "first axis" (i.e., axis extending along the exterior surface of connector plug in a longitudinal direction of the connecting member of the jig plate) and its positional relationship relative to the

¹ Although the Examiner refers to the connecting member as corresponding to reference numeral 27 in Fig. 7, it is understood by appellants from the context of the Examiner's statement of the rejection that the Examiner intended to refer to reference numeral 21 rather than 27 in Fig. 7 since only reference numeral 21 denotes retaining hook lever which retains the connector plug 20 to the ferrule holder.

"second axis" of the connector plug (i.e., the first and second axis being generally orthogonal to one another) during the polishing operation. Yamada does not disclose, however, that the embodiment of Fig. 7 relates at all to the embodiments of Figs. 3 and 6. In particular, there is no disclosure in Yamada that the embodiment of Fig. 7 may be modified to adopt the angular inclination of the ferrule holder assembly shown in Fig. 6 during a polishing operation. Thus, the Examiner's reliance on the embodiment of Fig. 7 of Yamada to arrive at the claimed invention without setting forth a proper motivation for modifying the embodiment of Figs. 3 and/or 6 in Yamada in view of the embodiment of Fig. 7 is improper under 35 U.S.C. §103(a).

In the Advisory Action, the Examiner for the first time identified two additional structures in Yamada as corresponding to the "connecting member" of the jig plate recited in independent claim 21. Relying on the embodiment of Fig. 8 in Yamada, the Examiner contends that the cylinder 32 corresponds to the "connecting member" of the jig plate recited in claim 21. However, like the embodiment of Fig. 7, the embodiment of Fig. 8 in Yamada does not relate at all to the embodiments of Figs. 3 and 6. In particular, there is no disclosure in Yamada that the embodiment of Fig. 8 may be modified to adopt the angular inclination of the ferrule

holder assembly shown in Fig. 6 during a polishing operation. Thus, the Examiner's reliance on the embodiment of Fig. 8 of Yamada to arrive at the claimed invention without setting forth a proper motivation for modifying the embodiment of Figs. 3 and/or 6 in Yamada in view of the embodiment of Fig. 8 is also improper under 35 U.S.C. §103(a).

The other structure identified in the Advisory Action as corresponding to the "connecting member" of the jig plate recited in claim 21 is, according to the Examiner, some structure which is not numbered in Fig. 6 of Yamada "but is located within sleeve 2" of the ferrule holder assembly. It is unclear to appellants what structure "located within sleeve 2" of the ferrule holder assembly would correspond to the "connecting member" of the jig plate recited in claim 21. If the Examiner is referring to the "adapter" 2 in Fig. 6 of Yamada, what specific structure in the adapter 2 corresponds to the "connecting member" of the jig plate recited in claim 21? Additionally, how does such structure in the sleeve or adapter 2 meet the limitation recited in claim 21 with respect to the positional relationship between the axis extending in the direction of inclination of the end faces of the ferrule and optical fiber and the axis of the optical connector plug disposed generally orthogonal to the first axis (i.e., axis extending along the exterior surface of connector plug in a

longitudinal direction of the connecting member of the jig plate)? Appellants respectfully request that in response to this brief on appeal, the Examiner address the foregoing inquiries concerning the Examiner's position taken in the Advisory Action with respect to the disclosure in Fig. 6 of Yamada.

Independent claim 28 is directed to a jig plate for use with an end face polishing machine having a polishing member for undergoing rotation in a first direction of rotation to polish end faces of an optical fiber and a ferrule fixed to an end of the optical fiber of an optical connector plug during a polishing operation. Claim 28 recites that the jig plate comprises a body, a mounting part connected to the body for mounting the jig plate to the end face polishing machine, a holding part disposed in a surface of the body, and a holding member for removably supporting the optical connector plug in the holding part so that the end faces of the ferrule and optical fiber confront a polishing surface of the polishing member when the jig plate is mounted on the end face polishing machine. Claim 28 further recites that the holding member has an engaging portion for detachable engagement with a connecting member of the optical connector plug to removably support the optical connector plug so that during a polishing operation, the end faces of the ferrule and

optical fiber rotate in a second direction of rotation opposite to the first direction of rotation while contacting a polishing surface of the polishing member at a preselected angle of inclination and while an axis extending in the direction of inclination of the end faces of the ferrule and optical fiber coincides with a first axis of the optical connector plug disposed generally orthogonal to a second axis of the optical connector plug extending along an exterior surface thereof on which the connecting member is disposed and extending in a longitudinal direction of the connecting member.

Yamada in view of Ohno do not disclose or suggest the structural and functional combination of the jig plate recited in claim 28, including (1) the structure (i.e., engaging portion) and corresponding function of the holding member, (2) the ferrule and optical fiber rotating in a direction of rotation opposite to the rotation direction of the polishing member during a polishing operation, (3) the specific positional relationship between the ferrule/optical fiber (i.e., preselected angle of inclination) relative to the polishing member, and (4) the specific positional relationship between the axis extending in the direction of the end faces of the ferrule and optical fiber and the axis extending along the exterior surface of connector plug in a longitudinal direction of the connecting member of the jig plate.

Thus, in view of the foregoing, one of ordinary skill in the art would not have been led to modify Yamada in view of Ohno in the manner proposed by the Examiner in the statement of rejection. The only basis for the combinations urged by the Examiner in the rejection is appellants' own disclosure, and such hindsight rejections are improper. See, for example, Diversitech Corp. v. Century Steps, Inc., 7 USPQ2d 1315, 1318 (Fed. Cir. 1988); In re Geiger, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987); Panduit Corp. v. Dennison Manufacturing Co., 227 USPQ 337, 343 (Fed. Cir. 1985); Interconnect Planning Corp. v. Feil, 227 USPQ 543, 551 (Fed. Cir. 1985).

Moreover, in assessing obviousness, the invention as a whole must be considered, including its properties and the problems it solves. See In re Wright, 6 USPQ2d 1959, 1961 (Fed. Cir. 1988) ("the determination of whether a novel structure is or is not 'obvious' requires cognizance of the properties of that structure and the problem which it solves, viewed in light of the teachings of the prior art"); In re Rinehart, 189 USPQ 143, 149 (CCPA 1976) ("the particular problem facing the inventor must be considered in determining obviousness"); Lindemann Maschinenfabrik GmbH v. American Hoist and Derrick Co., 221 USPQ 481, 488 (Fed. Cir. 1984) ("it is error to focus solely on the product created, rather than on the obviousness or nonobviousness of its creation").

In rejecting independent claims 1 and 28, the Examiner did not properly take into account the improvements achieved by the claimed structure of the jig plate disclosed in the specification. More specifically, by the specific structure of the jig plate recited in claims 21 and 28, during a polishing operation the optical connector plug can be maintained at a precise orientation relative to the polishing member so that an axis extending in the direction of inclination of the end face of the ferrule and the end face of the optical fiber coincides with an axis of the optical connector plug disposed generally orthogonal to another axis of the optical connector plug extending along an exterior surface thereof in a longitudinal direction of the connecting member which is disposed on the exterior surface. By this orientation, the end face of the ferrule and the end face of the optical fiber are polished with improved polishing accuracy to reduce displacement between the center of curvature of the end faces of the ferrule and optical fiber and a central axis of the optical fiber, thereby reducing insertion loss. (Spec., pg. 8, lines 7-17; pg. 38 lines 19-25).

Thus, it is incorrect, as the Examiner has done here, to merely focus on the differences between the prior art and the invention claimed in independent claims 21 and 28, and

then to state that the differences themselves are obvious. As set forth above, the invention claimed in independent claims 21 and 28 as a whole must be considered, including its properties and the problems it solves.

Accordingly, one of ordinary skill in the art would not have been led to modify Yamada in view of Ohno in the manner proposed by the Examiner in the statement of rejection. Again, the only basis for the modifications urged by the Examiner in the rejection is appellants' own disclosure, and such hindsight rejections are improper. Diversitech Corp. v. Century Steps, Inc., supra, at 1318.

**B. Argument for Dependent Claims
22-24, 29-30 and 35-38**

Claims 22-24 and 29-30, 35-38 depend on and contain all of the limitations of independent claims 21 and 28, respectively, and, therefore, distinguish from the combined teachings of Yamada and Ohno at least in the same manner as claims 21 and 28.

Moreover, there are separate patentability grounds for dependent claims 23 and 29.

Claims 23 and 29 includes the additional limitation that the connecting member comprises a latch, and that the holding member has a holding hole having the engaging portion for detachable engagement with the latch to removably support

the optical connector plug. No corresponding structure is disclosed or suggested by the prior art of record. For example, in Fig. 3 of Yamada the holding member 4 does not have a holding hole with an engagement portion for detachable engagement with a latch to removably support the optical connector plug. Instead, the optical connector plug in Fig. 3 of Yamada is supported in place by the adapter hook 2a of the adapter 2. Likewise, in the embodiment of Fig. 7 in Yamada, a latch 21 engages a portion of an adapter 2, not any part of the holding member 4, to support the optical connector plug in place.

In view of the foregoing, appellants respectfully submit that claims 21-24, 28-30 and 35-38 patentably distinguish over the prior art record and, therefore, the rejections of these claims should be reversed.

Respectfully submitted,

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VIII. Claims Appendix.

Appealed claims 21-24, 28-30 and 35-38 are reproduced below in smooth form:

21. In combination:

an optical connector plug comprised of a plug housing for supporting a ferrule fixed to an end of an optical fiber and a connecting member connected to an exterior surface of the plug housing, the optical connector plug having a first axis extending along the exterior surface thereof in a longitudinal direction of the connecting member;

an end face polishing machine comprised of a polishing member having a polishing surface for undergoing rotational movement in a first direction of rotation to polish an end face of the ferrule and an end face of the optical fiber during a polishing operation; and

a jig plate comprised of a jig plate body, a mounting part connected to the jig plate body for mounting the jig plate on the end face polishing machine, a holding part formed in a surface of the jig plate body, and a holding member for removably supporting the optical connector plug in the holding part so that the end face of the ferrule and the end face of the optical fiber confront the polishing surface of the polishing member when the jig plate is mounted on the

end face polishing machine, the holding member having an engaging portion for detachable engagement with the connecting member of the optical connector plug to removably support the optical connector plug so that during a polishing operation, the ferrule rotates in a second direction of rotation opposite to the first direction of rotation while the end face of the ferrule and the end face of the optical fiber contact the polishing surface of the polishing member at a preselected angle of inclination and while an axis extending in the direction of inclination of the end face of the ferrule and the end face of the optical fiber coincides with a second axis of the optical connector plug disposed generally orthogonal to the first axis.

22. A combination according to claim 21; wherein the second axis of the optical connector plug extends along an exterior surface of the optical connector plug different from the exterior surface thereof to which the connecting member is connected.

23. A combination according to claim 21; wherein the connecting member comprises a latch; and wherein the holding member has a holding hole having the engaging portion for detachable engagement with the latch to removably support the optical connector plug.

24. A combination according to claim 23; wherein the holding member is removably mounted in the holding part.

28. A jig plate for use with an end face polishing machine having a polishing member for undergoing rotation in a first direction of rotation to polish end faces of an optical fiber and a ferrule fixed to an end of the optical fiber of an optical connector plug during a polishing operation, the jig plate comprising:

a body;

a mounting part connected to the body for mounting the jig plate to the end face polishing machine;

a holding part disposed in a surface of the body;
and

a holding member for removably supporting the optical connector plug in the holding part so that the end faces of the ferrule and optical fiber confront a polishing surface of the polishing member when the jig plate is mounted on the end face polishing machine, the holding member having an engaging portion for detachable engagement with a connecting member of the optical connector plug to removably support the optical connector plug so that during a polishing operation, the end faces of the ferrule and optical fiber rotate in a second direction of rotation opposite to the first direction of rotation while contacting a polishing surface of

the polishing member at a preselected angle of inclination and while an axis extending in the direction of inclination of the end faces of the ferrule and optical fiber coincides with a first axis of the optical connector plug disposed generally orthogonal to a second axis of the optical connector plug extending along an exterior surface thereof on which the connecting member is disposed and extending in a longitudinal direction of the connecting member.

29. A jig plate according to claim 28; wherein the connecting member of the optical connector plug comprises a latch; and wherein the holding member has a holding hole having the engaging portion for detachable engagement with the latch to removably support the optical connector plug.

30. A jig plate according to claim 29; wherein the holding member is removably mounted in the holding part.

35. A combination according to claim 21; wherein the holding member supports the optical connector plug in the holding part so that during a polishing operation, a longitudinal axis of the ferrule fixed to the end of the optical fiber is disposed at an obtuse angle relative to the polishing surface of the polishing member.

36. A combination according to claim 35; wherein a longitudinal axis of the holding member is disposed at the obtuse angle relative to the polishing surface of the polishing member during a polishing operation.

37. A jig plate according to claim 28; wherein the holding member supports the optical connector plug in the holding part so that a longitudinal axis of the ferrule fixed to the end of the optical fiber is disposed at an obtuse angle relative to the polishing surface of the polishing member.

38. A jig plate according to claim 37; wherein a longitudinal axis of the holding member is disposed at the obtuse angle relative to the polishing surface of the polishing member during a polishing operation.